Agenda item : F-2.1

39th Argos Operations Committee
Prepared by CLS
Date : May 10, 2005

OPERATIONS REPORT

1. Ground receiving stations

1.1. Global stations

- The two global stations able to acquire the STIP telemetry are still the Fairbanks and Wallops Island stations.

- With only these two antennas, we have two blind orbits per day and per satellite. A palliative solution was proposed by using the Lannion station (CLS and Meteo France suggestion) or by using the Barrow station (NOAA suggestion). However, none of these solutions have been tried or tested since 2000.

- The two global stations of Fairbanks and Wallops deliver the STIP telemetry from the satellites NOAA-12, NOAA-14, NOAA-15, NOAA-16 and NOAA-17.

- As regards NOAA-12, only two orbits per day are delivered by NOAA/NESDIS. It is just enough to collect the minimum amount of data from the orbitography Argos beacons required for the processing of the Argos location.

- The STIP telemetry from NOAA-14 is delivered by group of three or four orbits.

Figure 1 shows STIP data set arrival times at the Toulouse and Largo processing centers. Ideally, one data set should be received every 100 minutes.

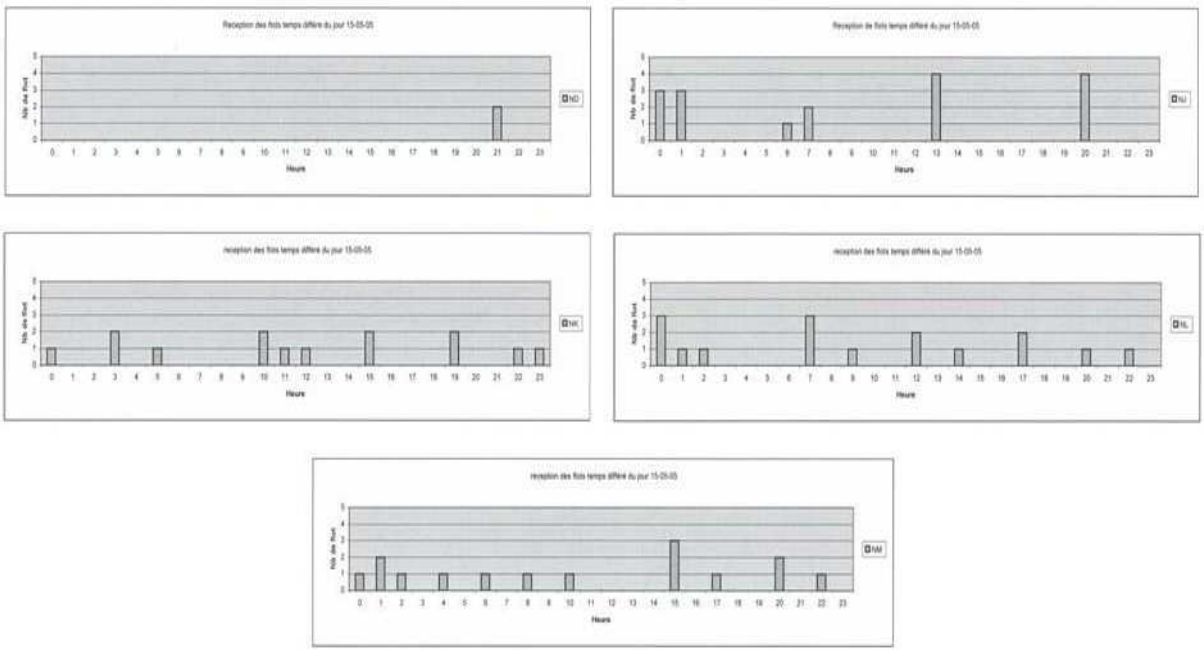

Figure 1

Figure 2 shows the satellite orbit plans in May 2005.

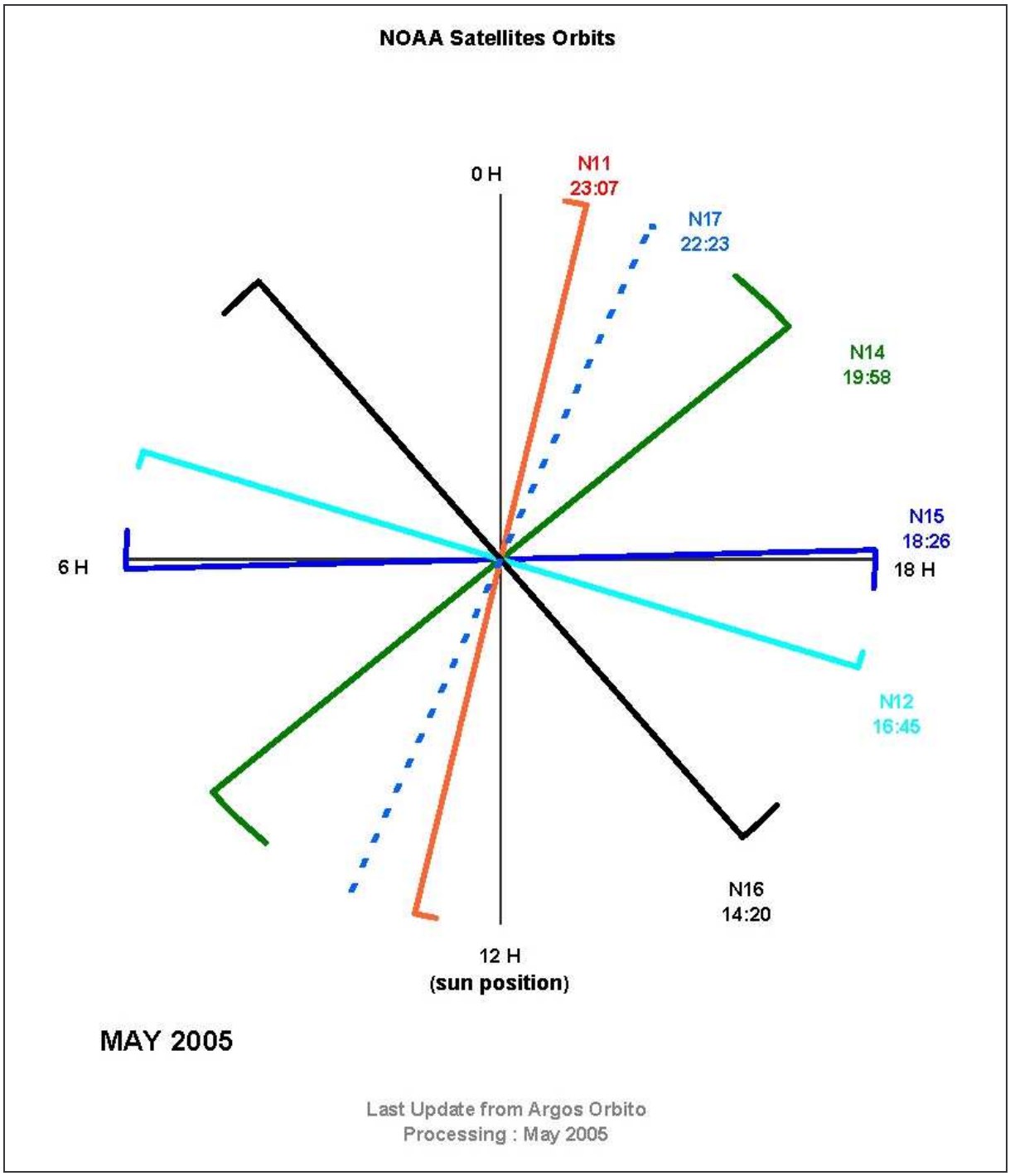

Figure 2

Since the decommissioning of NOAA-11 on June 16th, 2004, the Argos constellation includes 5 satellites and the data are distributed as follows:

- Basic service: NOAA-17, NOAA-16
- Multi-satellite service: NOAA-17, NOAA-16, NOAA-15, NOAA-14, NOAA-12.

1.2. Regional stations

CLS and Service Argos Inc. pursued their efforts in 2004 to increase the number of receiving stations able to provide TIP data sets from the NOAA satellites. Four new stations joined the Argos network during the year. They are in Bali (Indonesia, CLS), Bitung (Indonesia, CLS), Shangai (China, East China Sea Fisheries Research Institute) and Tahiti (French Polynesia, Meteo France).

There are currently 42 stations delivering TIP data sets to CLS and Service Argos Inc. Most of them process data from NOAA-16, NOAA-17, NOAA-15, NOAA-14 and NOAA-12, so we are able to maintain good throughput times for delivery of results.

List of regional receiving stations

	Antennas	Sigle	Country	Operator	Possible satellites
1	Athenes	AT	Greece	NCMR	**N12, N14, N15, N16, N17**
2	Aussaguel	AU	France	CLS	**N12, N14, N15, N16, N17**
3	Bali	BL	Indonesia	CLS	**N12, N14, N15, N16, N17**
4	Bitung	BI	Indonesia	PT CLS	**N12, N14, N15, N16, N17**
5	Buenos Aires	BA	Argentina	INTA	**N12, N14, N15, N16, N17**
6	Cape Town	SA	South Africa	CLS/SAWB	**N12, N14, N15, N16, N17**
7	Casey	CA	Australia (Antarctica)	BOM	**N12, N14, N15, N16,**
8	Cayenne	CY	France (Guyana)	IRD	**N12, N14, N15, N16, N17**
9	Darwin	DA	Australia	BOM	**N12, N14, N15, N16, N17**
10	Edmonton	ED	Canada	Envir. Canada	**N12, N14, , N16, N17**
11	Fidji	FI	Fidji	FMS	**, N14,N15 , ,**
12	Gilmore	GC	USA	NOAA/NESDIS	**N12, N14, N15, N16, N17**
13	Halifax	HF	Canada	Can. Coast Guard	**N12, N14, N15, N16, N17**
14	Hatoyama	HA	Japan	NASDA/EOC	**N12, N14, N15, N16,**
15	Hawaï	HW	USA	NOAA/NWS	**N12, , N15, N16, N17**
16	Helsinki	HL	Finland	CLS	**N12, N14, N15, N16, N17**
17	Ile de la Réunion	RN	France (Reunion Island)	Météo France	**N12, N14, , N16,**
18	Ile de la Réunion	RE	France (Reunion Island)	IRD	**N12, N14, N15, N16, N17**
19	Lannion	WE	France	Météo France	**, , N15, N16, N17**
20	Las Palmas	LP	Canaries Island	Univ. Las Palmas	**N12, N14, N15, N16**
21	Las Palmas	CN	Canaries Island	CLS	**N12, N14, N15, N16, N17**
22	Lima	PR	Peru	CLS perù	**N12, N14, N15, N16, N17**
23	Melbourne	ME	Australia	BOM	**N12, N14, N15, N16, N17**
24	Miami	MI	USA	NOAA/AOML	**N12, N14, N15, N16, N17**
25	Monterey	MO	USA	NESDIS/NWS	**N12, , N15 , N16, N17**
26	Noumea	NO	France (New Caledonia)	IRD	**N12, N14, , N16,**
27	Oslo	OS	Norway	NMI	**N12, N14, N15, N16, N17**
28	Perth	PE	Australia	BOM	**N12, N14, N15, N16, N17**
29	Petropavlosk	PT	Russia	Rybradiov	**N12, N14, N15, N16, N17**
30	Punta Arenas	PA	Chile	meteo Chile	**N12, N14,N15 , ,**
31	Riyadh	RY	AU	KACST	**N12, N14, N15, N16, N17**
32	Rothera	RO	Antartica		**N12, N14, N15, N16, N17**
33	Santiago	CH	Chile	meteo Chile	**N12, N14,N15 , ,**
34	Shangai	SH	China	ECSFRI	**N12, N14, N15, N16, N17**
35	Singapore	SG	Singapore	SMM	**N12, N14, N15, N16, N17**
36	Sondre	GR	Greenland	DMI	**N12, N14, N15, N16, N17**
37	Tahiti	TA	French Polynesia	IRD	**N12, N14, N15, N16, N17**
38	Tokyo	JM	Japan	Jamstec	**N12, N14, N15, N16, N17**
39	Toulouse	RV	France	CLS	**N12, N14, N15, N16, N17**
40	Tromsoe	ST	Norway	KSAT	**N12, N14, N15, N16, N17**
41	Wallops	WI	USA	NOAA/NESDIS	**N12, N14, N15, N16, N17**
42	Wellington	NZ	New-Zeland	Met Office	**, N14, N15, N16, N17**

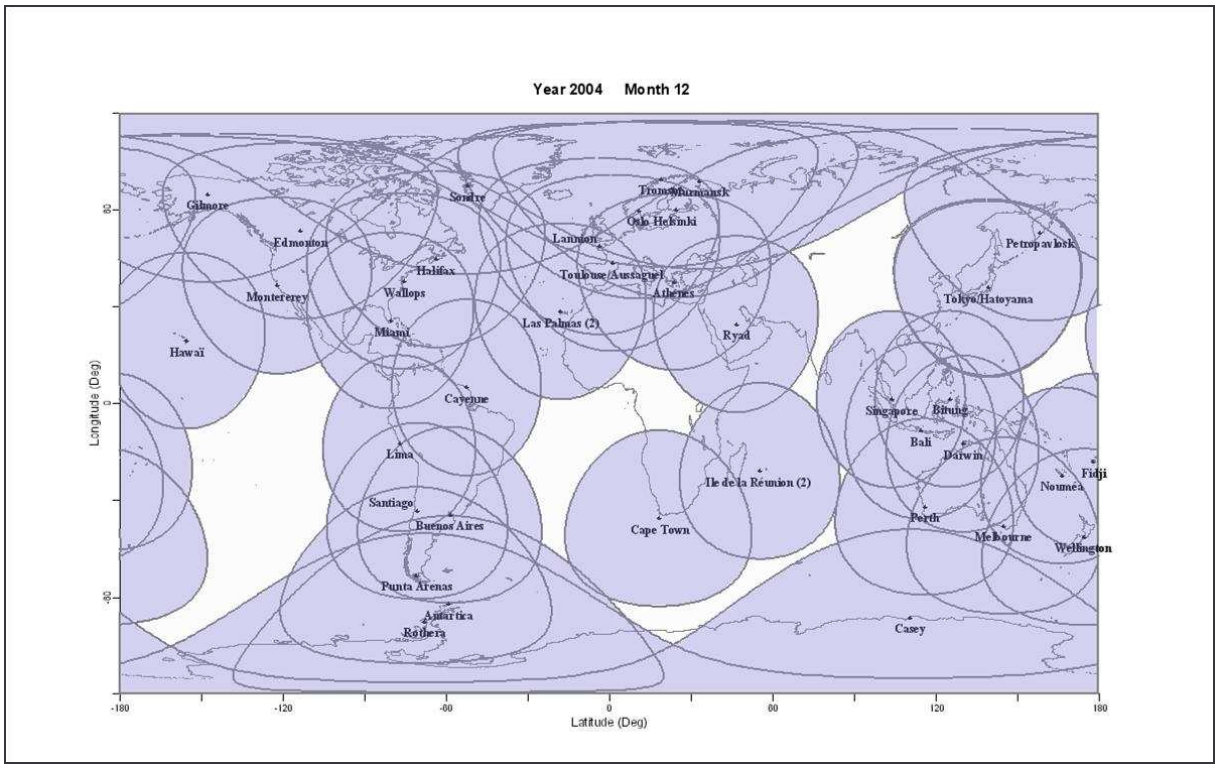

Figure 3

1.3. Processing centers

The two global processing centers in Toulouse and Largo continue to process data sets from all receiving stations, handling over 550 data sets per day (see Figure 4).

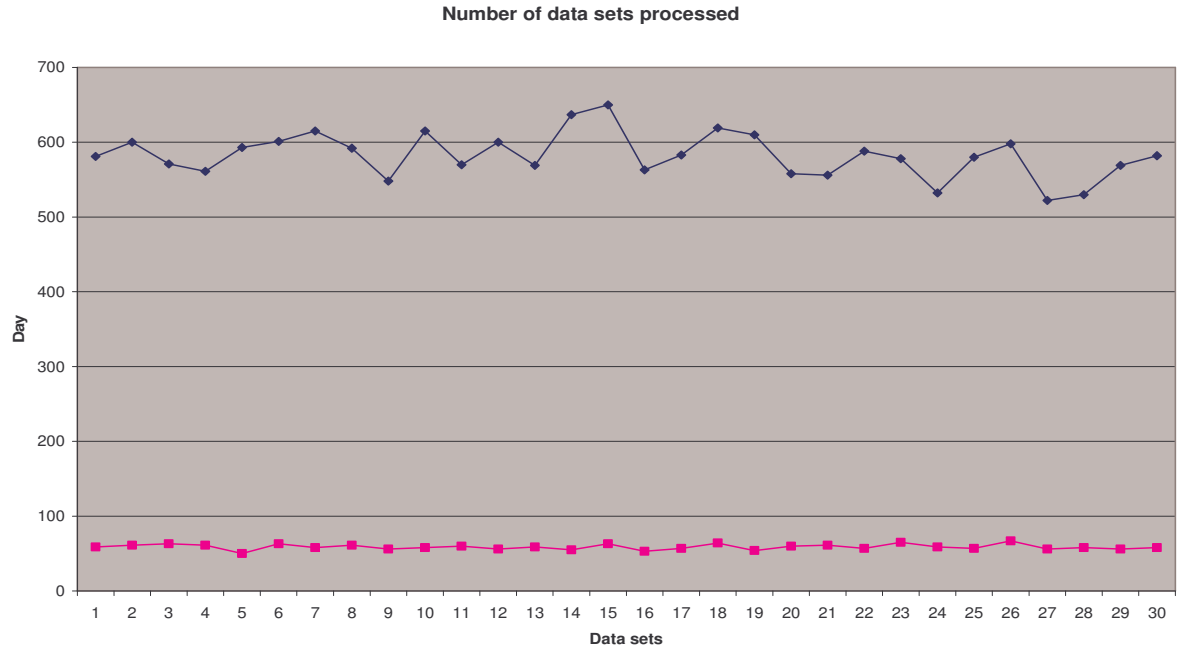

Figure 4

The Australian regional processing center, located in Melbourne, has been closed in 2004. There was no more real interest to keep open this center. On the other hand, in 2004, we created the Indonesian processing center located in Djakarta. This center is essentially in charge of managing the fishing vessels in the Indonesian area.

All the regional processing centers inTokyo, Lima and Djakarta only process data sets from stations covering their region. Supplementary data providing global coverage are supplied by the Toulouse center or by the Largos center if necessary.

The number of Argos platforms operating continues to increase. In April 2004, more than 7800 platforms were seen on average per day (figure 5). However, each of the two global centers processed data from 14 000 individual platforms during this month.

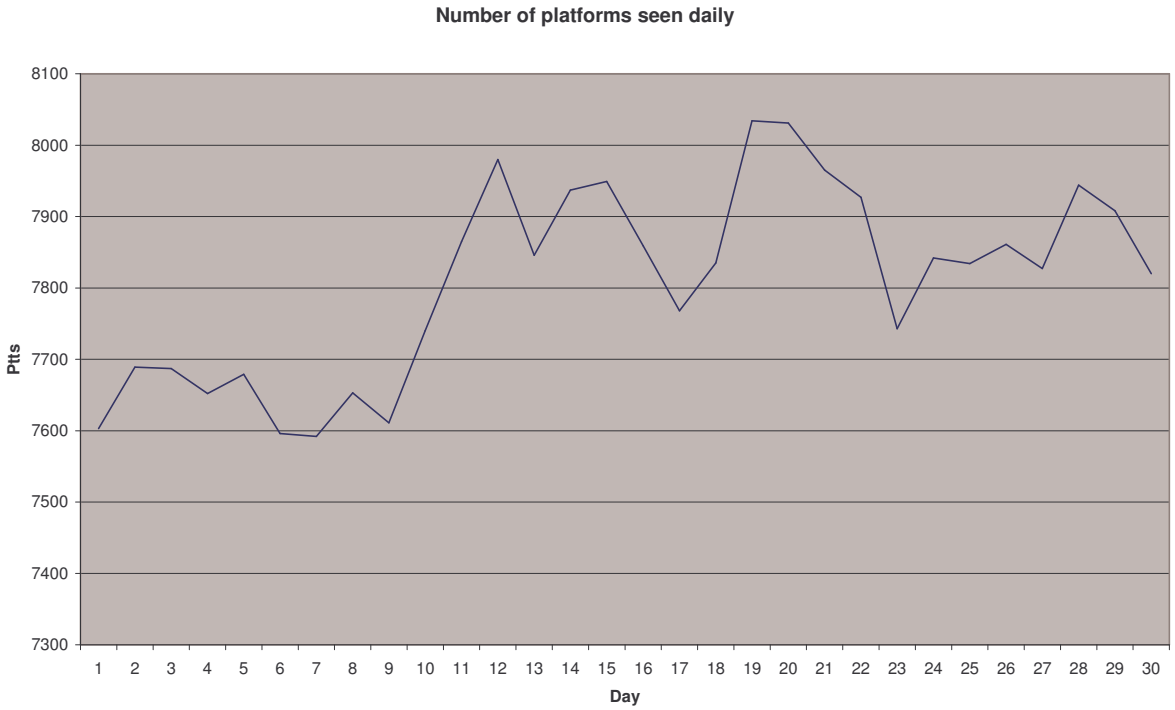

Figure 5

Figures 6 and 7 below show the number of locations and messages computed every day by the Largo and Toulouse centers.

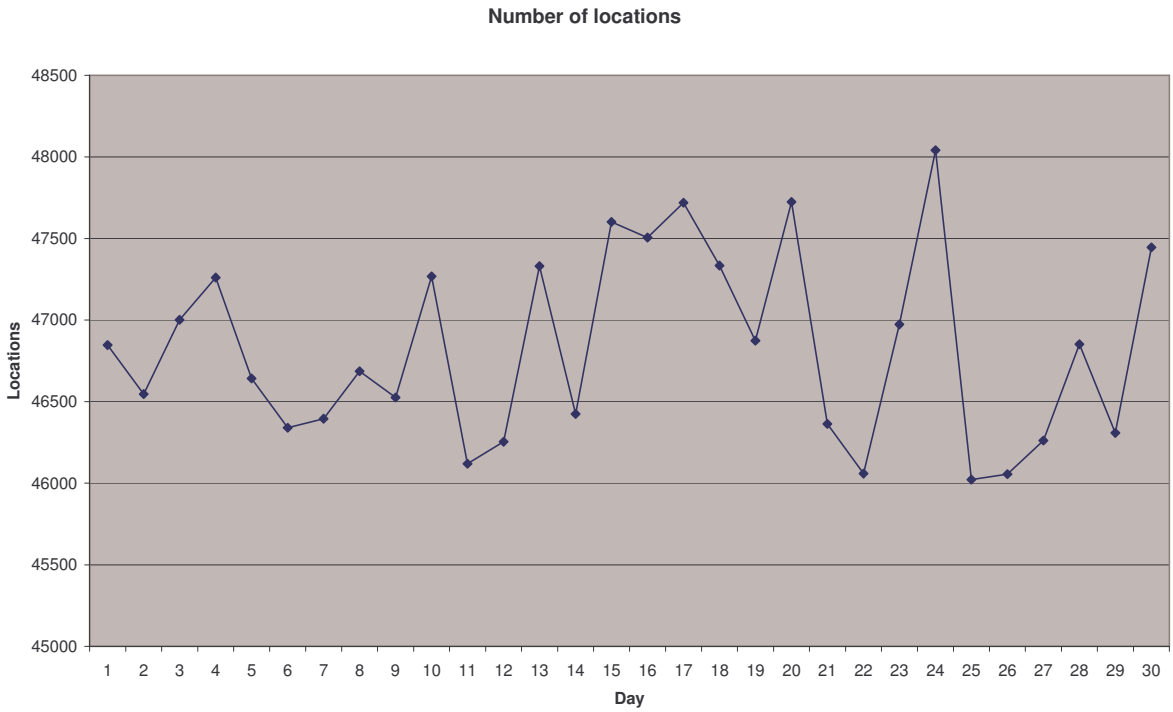

Figure 6

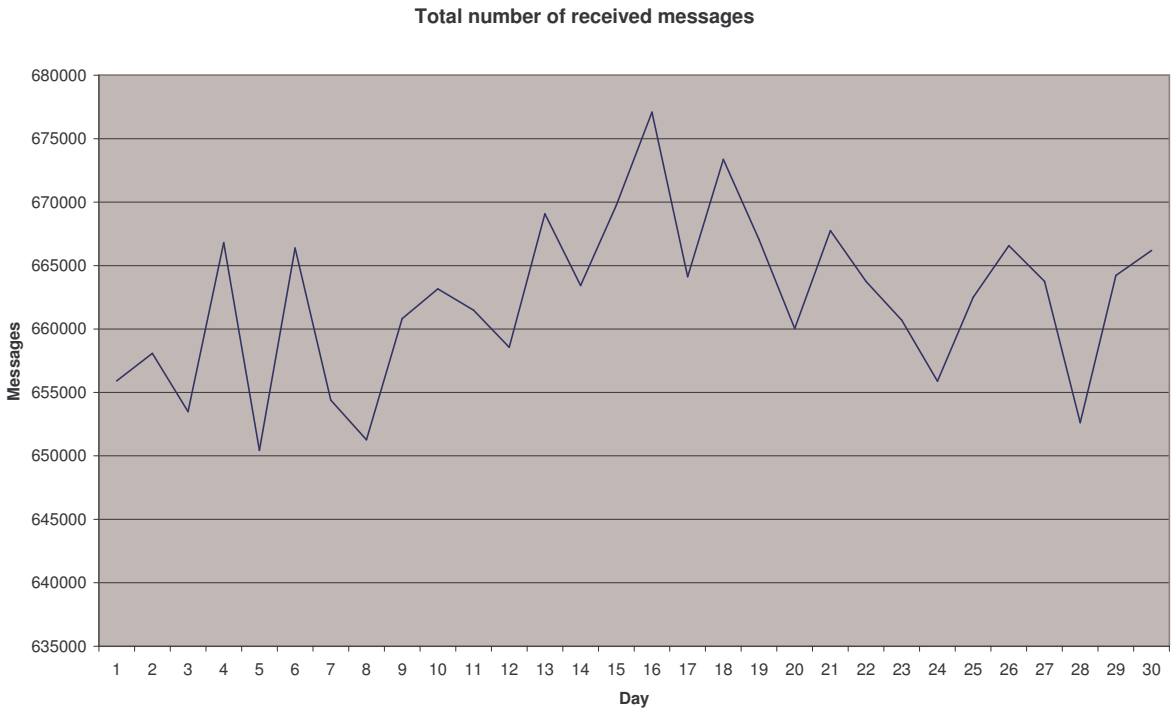

Figure 7

2. Communication links

The Internet is the main communication link used to distribute processed data to users and to retrieve data sets from receiving stations. The Toulouse center has now a double access (2 Mbits + 2 Mbits) which improve the reliability of our communication facilities. The same has been done at the Largo center in 2003.

The X25 protocol has been stopped at Service Argos Inc but continues to be used by the Toulouse center to send data to a few users (less than 20) concerned by security reasons. This X25 protocol should be definitively abandoned in 2006.

3. Throughput time for delivery results

CLS throughput times for delivery of results should be calculated in terms of the time taken to reach end users.
For each message received by the satellite, we compute the data turnaround time/data availability which is the time elapsed between the recording of the message on board the satellite and processing of the same message by the global processing center.

Figure 8 shows the throughput time for delivery of results for stored data from NOAA-17, NOAA-16 and NOAA-15.
57% of the data are available within two hours while 77% of the data are available within three hours.

We can correlate these statistics with those produced by NOAA, which computes data set delivery times to the Argos Global Processing Centers, while CLS computes result delivery times to Argos users. These results delivery times include the orbital delay, the time taken by NOAA to deliver data sets and the time taken to process them by the Argos global processing centers.

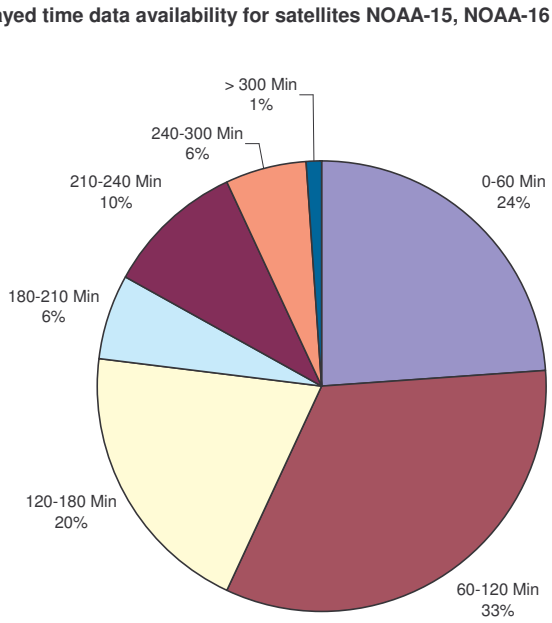

Figure 8

Figure 9 shows the throughput time for delivery of results for real-time data from NOAA-17, NOAA-16, NOAA-15, NOAA-14 and NOAA-12 and acquired by the 33 HRPT receiving stations.

96 % of these real-time data are available within 30 minutes.

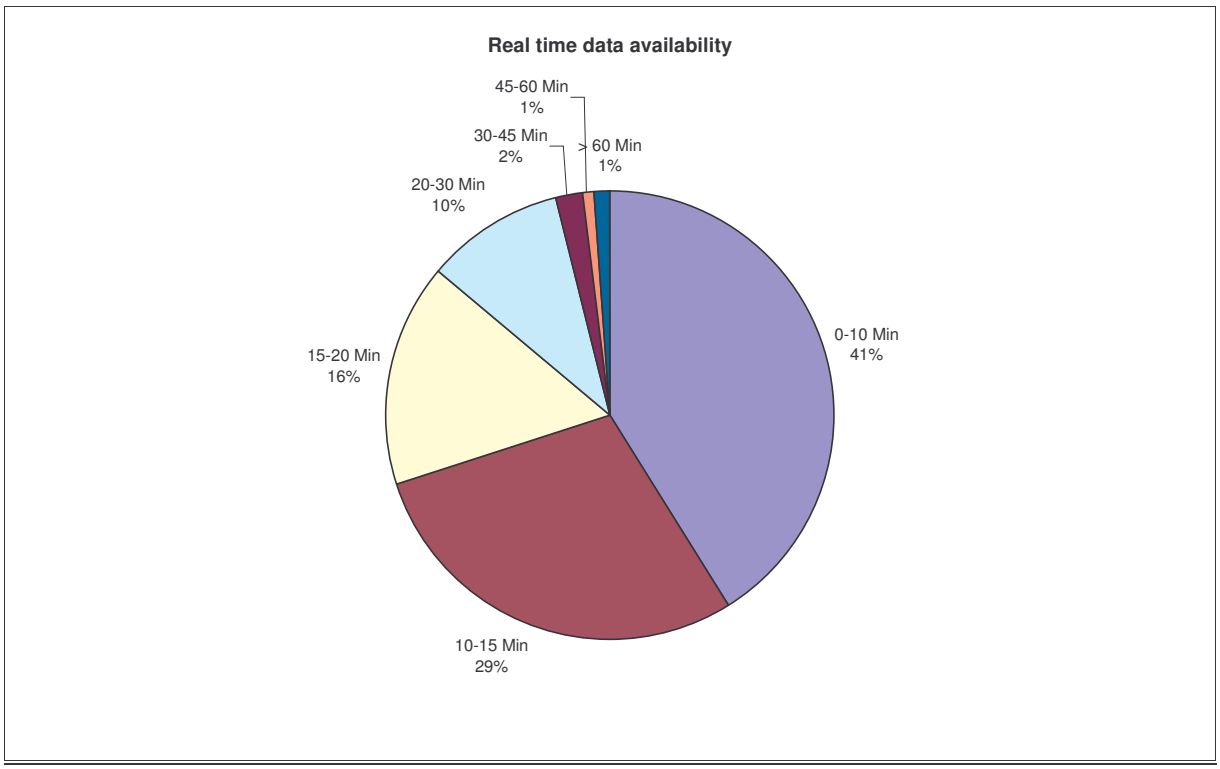

Figure 10

The throughput time for delivery of results for real-time data includes three main delays:

- the satellite pass duration, because we have to wait for the end of the pass to transfer and process the data set;
- the time taken to transfer the data set to the global processing centers. Most transfers go over the Internet. The transfer rate is getting better and better.
- the time taken to process the data set by the global processing centers, which is not significant (less than 30 seconds).